CLAIMS

1. A spread spectrum radio frequency communication system comprising:

a Forward Error Correction (FEC) algorithm to encode digital data to provide a plurality of symbol groups;

an interleaving algorithm to map each one of the plurality of symbol groups into a corresponding one of a plurality of coherent subbands; and

a Walsh subband encoder to encode each one of the plurality of coherent subbands.

2. The communication system as recited in Claim 1 wherein the FEC algorithm uses a Reed Solomon FEC code.

3. The communication system as recited in Claim 1 wherein the FEC algorithm uses a Turbo Code FEC code.

4. The communication system as recited in Claim 1 wherein the FEC algorithm uses a convolution FEC code.

5. The communication system as recited in Claim 1 comprising a transmission security device to encrypt each one of the Walsh encoded symbol groups.

6. The communication system as recited in Claim 5 comprising an Inverse Fast Fourier Transform (IFFT) coupled to the transmission security device.

7. A method for reducing transmission interference with other wireless communications systems comprising the steps of:

inserting zero amplitude weights in at least one of a plurality of narrowband frequency subbands; and

spectrum tailoring each one of the plurality of the transmitted narrowband frequency

subbands to any available frequency allocation to remove undesirable interference.

8. A method for reducing receive interference from other wireless communications systems comprising the steps of:

detecting and erasing corrupted data in at least one of a plurality of received narrowband frequency subbands having .

9. A method for reducing receive degradation due to multipath fading comprising the steps of:

detecting and erasing faded data in at least one of a plurality of received narrowband frequency subbands.

10. A method of providing a spread spectrum radio frequency communication signal comprising the steps of:

forming a stream of data into a plurality of data packets;

embedding each data packet into a physical layer packet comprising the steps of adding a packet header, performing a cyclic redundancy check and encoding the data;

the encoding the data step comprising the steps of:

encoding baseband data with a Reed Solomon forward error correction algorithm to provide RS symbols; and

interleaving the RS symbols across a plurality of coherent subbands; and

subband-encoding each coherent subband with a low rate Walsh code.

11. A spread spectrum radio frequency communication system comprising:

a Forward Error Correction (FEC) algorithm to encode digital data to provide a plurality of symbol groups, the FEC algorithm using a Reed Solomon FEC code;

an interleaving algorithm to map each one of the plurality of symbol groups into a corresponding one of a plurality of coherent subbands;

a Walsh subband-encoder to encode each one of the plurality of frequency subbands.

12. The system as recited in claim 11 further comprising:

a transmission security device to encrypt each one of the Walsh encoded symbol groups; and

an Inverse Fast Fourier Transform (IFFT) coupled to the transmission security device.

13. The system as recited in claim 11 further comprising a subband filter to excise a frequency subband to prevent co-site interference with another radio system.

14. The system as recited in claim 13 further comprising a corresponding receiver having a subband filter to excise the corresponding frequency subband as in the transmitter.

15. The system as recited in claim 14 wherein both the transmitter and receiver perform different subband mapping that avoids mapping symbols into excised subbands.